THUNDER MOUNTAIN

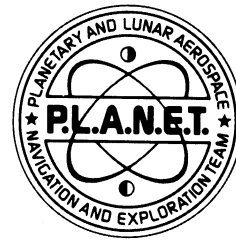
A Mission In Our Solar System

By Tom Snyder Productions

Travel through the Solar System in this real-time simulation.

Contains 2 versions:
ATARI/COMMODORE
Atari® 800, XL, or XE, 48K;
or Commodore 64/128™
Single disk drive—Joystick
00627

To: Specially Selected Star Pilots
From: P.L.A.N.E.T.



WARNING: Reading this dossier will be interpreted as acceptance of this assignment. If you do not wish to take part, DO NOT CONTINUE.

Your record indicates that you are an intelligent, resourceful, and skilled pilot, but those things merely form the bare necessities for the mission, codenamed the Halley Project, that you are about to be asked to undertake. You'll need courage, tenacity, and a detailed knowledge of the Solar System. Unless you possess all of these qualities, back down now!

You must complete ten missions in our Solar System. Each will be more difficult than the last. You will be required to visit various planetary and lunar bodies. You will be told your goals in flight. As you complete each leg of a mission, your next destination will be transmitted to you. Sometimes you will be told exactly where to go; other times the information will be little more than cryptic clues.

To aid your navigation you will have the P.L.A.N.E.T. SSM (Simple Star Map), included herein, which shows the zodiacal constellations (it isn't much, but it's better than nothing!)

All trainees pilot the Mark Five Hyperjump Trainer. Your ship is equipped with the latest hyperspace drive and long-range radar. You will find complete technical operating instructions in the top secret files that make up this dossier. Use the section entitled "Flight Instructions - Quick Reference" to get your Hyperjump Trainer up and running and as a guide to spacecraft operational control specific to your particular computer.

Should you have difficulty with any of the mission objectives, there will be two directions you can take. The first is to give up and go home, and forget about your mission - we sincerely hope you don't seriously consider this option; after all, P.L.A.N.E.T. selected you specially. Second, and more highly recommended, is to find your nearest interplanetary library, where BOOKS are kept (books are an ancient form of mass storage), and ask for information about the Solar System.

If you manage to complete all ten missions, you will have the satisfaction of knowing that you are truly one of the best pilots in the Solar System.

Good luck, Star Pilot - you're going to need it!

Flight Instructions - Quick Reference

Equipment Needed

- Apple® (IIe, IIc, or II Plus), Atari® (800™, XL™, or XE™; 48K), or Commodore (64™ or 128™) computer
- Monitor or TV
- Disk drive
- Joystick (required for Atari and Commodore versions, optional for Apple version)

Loading Instructions

APPLE COMPUTERS:

1. If you are using a joystick, plug it in first, before turning on the computer.
2. Insert the disk, label side up, into the disk drive.
3. Turn on the computer and the monitor or TV.
4. The program will load. After the title screens, you will see a letter from P.L.A.N.E.T. Headquarters. When you have read the letter, press any key to go on.
5. Follow the directions on the screen to enter your name and select your mission.

ATARI COMPUTERS:

1. If you have an Atari 800, make sure the Atari BASIC cartridge is NOT in your computer.
2. Connect your joystick to controller port 1.
3. Turn on the disk drive and the monitor or TV.
4. When the disk drive busy light goes off, insert the disk, with the Atari side of the disk up (side two), into the disk drive and close the drive door.
5. Turn on the computer.
6. The program will load. After the title screens, you will see a letter from P.L.A.N.E.T. Headquarters. When you have read the letter, press any key.
7. Follow the directions on the screen to enter your name and select your mission.

COMMODORE COMPUTERS:

1. Make sure the joystick is plugged into controller port 2 before turning on the computer.
2. Turn on the disk drive and the monitor or TV.
3. Turn on the computer. If you have a Commodore 128, make sure the computer is in C64 mode.
4. When the disk drive busy light goes off, insert the disk, with the Commodore side of the disk up (side one), into the disk drive and close the drive door.
5. Type **LOAD "HALLEY",8,1** and press **RETURN.**
6. The program will load. After the title screens, you will see a letter from P.L.A.N.E.T. Headquarters. When you have read the letter and are ready to go on, press any key.
7. Follow the directions on the screen to enter your name and select your mission.

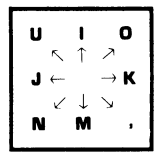
Special Options

	APPLE	ATARI	COMMODORE
RESTART THE PROGRAM	Esc	Reset	Run/Stop Restore (together)
ERASE NAMES/RECORDS	Control and E (together)	Option and I (together)	CTRL and I (together)

At the Control Panel

If you have an Atari or Commodore computer, you need a joystick to control spaceship functions. If you have an Apple computer, you can use either a joystick or the keyboard.

To make your spaceship accelerate in a certain direction, push the joystick in that direction. The longer you hold the joystick in that direction, the faster your speed will be. If you have an Apple computer and you are controlling the spaceship with the keyboard, use the following letter keys to indicate direction:



To accelerate using the keyboard, hold down the letter key that you press for direction. For example, if you want to accelerate straight ahead, press the I key and hold it down. The longer you hold it down, the faster your speed will be.
Note: On an Apple® II Plus, increase your speed by pressing the desired direction key several times.

To go into Hyperspace, increase your speed to 300,000 km/sec. At 250,000 km/sec., a warning buzzer sounds to let you know you are approaching Hyper space.

To brake, press the **space bar.** If you are in Hyperspace, pressing the space bar brings your ship to an immediate stop. If you are traveling at speed less than 300,000 km/sec., each press of the space bar reduces your speed by about 50%.

To change your field of vision, hold the joystick button down while you move the joystick to the left or to the right. If you have an Apple computer and you are controlling the spaceship with the keyboard, change your field of vision by pressing the ← or → keys. Note: Changing your field of vision does not alter the direction in which the spaceship is moving.

To select your power level, press **H** for High Power or **L** for Low Power.

To engage the automatic landing system when approaching a planet or moon, press **A** when the Planet/Moon Finder blinks and beeps. **Note:** There is no special landing area on Halley's Comet; simply fly into the comet to "land" on it.

To blast off from a planet or moon, press **B.**

To see the Radar Screen, press **R.**

The Radar Screen

To zoom in, push the joystick forward. If you have an Apple computer and you are controlling the spaceship with the keyboard, press the **I** key to zoom in on the Radar Screen. Zooming in puts you at a closer vantage point, but may not give you a full view of all of the planets at once.

To zoom out, pull back on the joystick. If you have an Apple computer and you are controlling the spaceship with the keyboard, press the **M** key to zoom out on the Radar Screen. Zooming out gives you a view of all of the planets at the same time.

To return to the Control Panel, press **R.**

MISSION
TECHNICAL REFERENCE GUIDE

Following are brief descriptions of each top-secret file:

Qualification Procedures for The Halley Project – a quick overview of the training missions and the scope of the project.

Starting the Missions: Powering Up – how to get going on your first mission.

The Control Panel – describes the equipment on your spaceship control panel and explains how to use this equipment to reach your destinations.

Navigating and Landing – explains how to use the program's Radar Screen and the Simple Star Map (enclosed with this package) to locate positions of planets and moons; provides step-by-step procedures for landing on planets and moons.

Intelligence-Gathering Resources – interesting books and articles that can increase your knowledge of space exploration, astronomy, and Halley's Comet. Some of them may help you solve the clues you are given with each mission.

Debriefing – procedures to help you remain in touch with the Solar System after you complete your missions and return to Earth; includes star-gazing activities.

A Final Note from P.L.A.N.E.T. – a description of the challenges involved in designing The Halley Project.

Simple Star Map – a map of the major constellations, as seen through your spaceship viewing screen. This map will be an invaluable help to you as you navigate in space; without it, you will be merely a cosmic drifter. Note that the Simple Star Map does not include every star visible from the Solar System, but represents the view from your ship.

00235THP-1

Qualification Procedures for The Halley Project

You begin your quest to qualify for The Halley Project without rank. To join The Halley Project, you must master 10 ranks, from Raven to Starbird. To advance a rank, you must fly the appropriate course, or mission, between specified bodies of the Solar System, landing on each planet or moon as you are directed.

As you begin each mission, you will be given instructions on the screen. Due to the sensitive nature of this information, you will not have access to specific instructions until you qualify for a specific mission. To further protect the secrecy of the missions, the instructions are often given as clues. You have to figure out where to go. To unravel the clue, you may need to do a little research on your own before you sojourn in the Solar System. For example, you might be told to land on a moon that has an atmosphere. Unless you can determine which moons fit this description and then maneuver yourself there, The Halley Project isn't for you. Note: Due to limitations in microcomputer technology, not all the moons of Jupiter and Saturn could be represented properly in the program. You will not be asked to travel to those moons that have not been included.

Keep in mind that each planet and moon revolves around the sun. Thus, each has a "dark side"—the side that seems invisible because it's facing **away** from the sun. Do not fear the dark side. Sometimes you may find your landing clearance on that side. See the Navigating and Landing File for additional information. Each mission begins and ends at the secret training installation located on Halley's Comet. Successful completion of a mission moves you to the next rank.

You will be timed, and the four fastest times will be recorded. Those with the fastest times will have the satisfaction of knowing they are **the** most qualified pilots in the galaxy. However, you don't have to be among the four fastest times to qualify for The Halley Project. Remember, only the best will endure P.L.A.N.E.T.'s tests to become part of The Halley Project. You must advance through the ranks in the order listed below.

1. Raven
2. Shrike
3. Vulture
4. Darter
5. Condor
6. Swift
7. Nighthawk
8. Falcon
9. Eagle
10. Starbird

Complete each mission in order. You cannot attempt the Nighthawk's mission, for example, until you have completed all the missions before it. You can redo missions as often as you like to improve your times. Listed below are some challenge times worth flying for:

Mission	**Time** (in minutes and seconds)
1. Raven	3:00
2. Shrike	4:30
3. Vulture	8:00
4. Darter	9:00
5. Condor	9:00
6. Swift	15:00
7. Nighthawk	10:00
8. Falcon	15:00
9. Eagle	20:00
10. Starbird	20:00

Starting the Missions: Powering Up

To get started on your mission, follow these steps:

1. Load the disk according to the directions on the enclosed Flight Instructions Reference Card.

2. After you've read the initial screens, you will see a name roster screen. Use the joystick* to select a blank line. Press the joystick button. Then type in the name you want to use as a pilot and press RETURN.

3. Choose the mission you want to fly by using the joystick to move the asterisk in front of that mission. Press the joystick button. (Remember that you must begin by flying the Raven mission. You can repeat a mission you've already done to improve your time, but you must do the missions in order.)

4. Read the directions on the screen that tell you what your destination is. It will be a planet or moon.

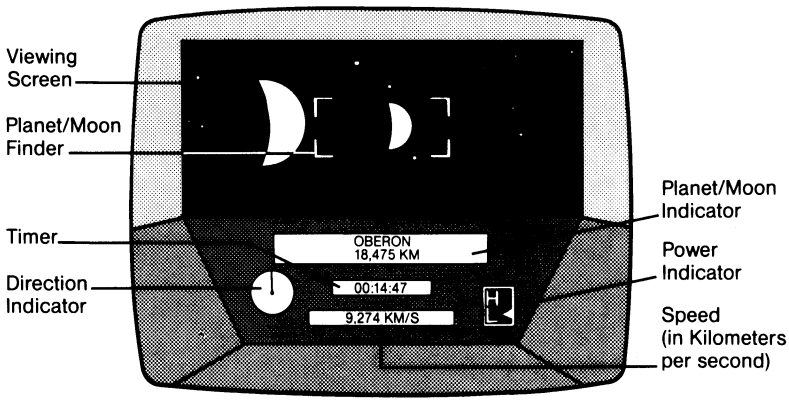
5. Use the Radar Screen and the Simple Star Map to determine where your destination is and how to get there.

6. Navigate your way to and then land on your destination. (See the Navigating and Landing File.) Once you've landed, proceed according to the instructions on the screen. Press B to blast off for your next destination.

*Throughout this manual, the input device is referred to as the joystick. Some versions may use the keyboard, a mouse, or other devices. Please see your Flight Instructions Reference Card for information.

The Control Panel

During each mission, you're seated at the control panel of your spaceship, somewhere in our Solar System. From your Viewing Screen, you see constellations, stars, planets, and moons just as they appear in space. Objects in space are very far away from each other. To help you reach your destinations, your ship is equipped with some special devices.



Control Panel

Viewing Screen—You can observe all the space around you through this Viewing Screen. Follow the steps on the Flight Instructions Reference Card to change your field of vision to see different views. It's usually a good idea to come to a complete stop before changing your field of vision.

Direction Pointer—This device shows which direction you are moving. For example, when you are moving toward a planet or moon shown on your Viewing Screen, the pointer will be up at the top of the dial. When you are moving away from an object, the pointer will be at the bottom of the dial. Thus, it is possible to be looking at a planet but be moving **away** from it.

Planet/Moon Finder—The marked area in the center of the Viewing Screen is your Planet/Moon Finder. The four marked corners will light up when a planet or moon comes within range. The Sun is always visible through the Finder.

Planet/Moon Indicator—As you approach an object and it becomes clearer, its name and your distance from it will appear here.

Power Meter—Your ship has two power levels, low and high. High is best for traveling great distances. It gives the engines more power. Low gives you more control and is helpful when maneuvering for a landing. To select a power level, press L for Low and H for High.

Speed—Keep a careful watch on your speed. It is very easy to fly by a planet or moon if you are going too fast. When your speed reaches 250,000 km/s (kilometers per second), you will hear warning sounds. At 300,000 km/s, the speed of light, you jump to Hyperspace. In Hyperspace, you travel at many times the speed of light.

Timer—The timer keeps track of the time it takes you to fly each mission. The timer does not run when you are not moving.

Using the Control Panel

To move in a direction, push the joystick in that direction. The longer you hold the joystick in that direction, the faster you will go. (Pilots using something other than a joystick should consult the Flight Instructions Reference Card.)

To go into Hyperspace, increase your speed to 300,000 km/s (the speed of light). A warning buzzer will sound when your speed reaches 250,000 km/s to let you know you're approaching Hyperspace. Once in Hyperspace, your distance traveled is reported in millions of kilometers.

To slow down or stop, press the space bar. If you are in Hyperspace, pressing the space bar brings you to an immediate stop. If you are traveling at a speed less than 300,000 km/s, each press of the space bar cuts your speed in half.

To change your field of vision, hold the joystick button down while you move the joystick to the right or to the left. NOTE: This will not change the direction in which you are moving. You may find it easier to come to a stop first before changing your field of vision.

To select your power level, press H for High Power or L for Low Power.

To engage the automatic landing system, press A on the keyboard. You can land only when the Planet/Moon Finder is blinking and beeping. See File #00235THP-4 for more information about landing. **(NOTE: There is no special landing area on Halley's Comet; to return to P.L.A.N.E.T.'s secret installation, simply fly right into the comet.)**

To blast off from a planet or moon, press B on the keyboard.

To see the Radar Screen, press R on the keyboard.

Using The Radar Screen

Your ship always stays at the center of the screen.

To zoom in, push forward on the joystick. When you zoom in, you see an enlarged view of the small region of space near your ship. You may not see all the planets on the screen at the same time.

To zoom out, pull back on the joystick. When you zoom out, you see an overview of the whole Solar System.

To return to the Control Panel, press R on the keyboard.

For a more detailed explanation of Radar Screen use, see the classified Navigating and Landing File (#00235THP-4).

Navigating and Landing

Space is a big place, and it's easy to get lost. Who knows how many amateur pilots are stranded somewhere in space because they never learned to navigate using their radar and the constellations on the Simple Star Map? Who knows how many are in eternal holding patterns because they never learned landing procedures? Don't let these disasters happen to you.

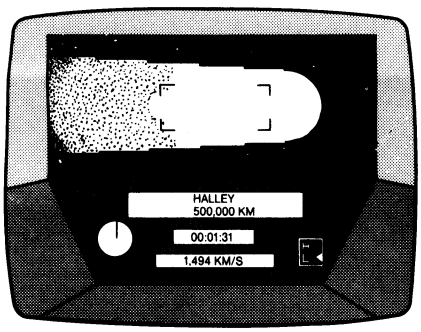
Navigating

Your Radar Screen and Simple Star Map (included with the program package) are essential instruments for navigating through the Solar System. Use them to help you go from one destination to the next.

Radar—Press R to see the Radar Screen. Step-by-step instructions for navigating by radar follow. Let's assume that you have just started a mission and that your destination is Earth.

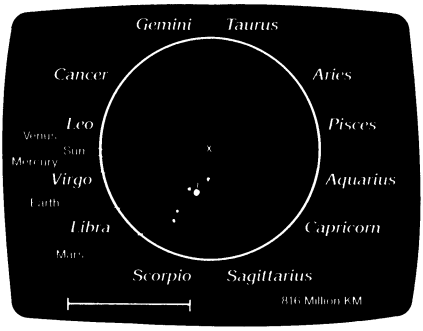
1. At the beginning of each mission, a message appears on the screen telling you your destination. The message may specify the destination or it may only give you a clue. If necessary, do some research to decipher a mission clue. In this example, your goal is to find and land on Earth.

As soon as you embark on a mission, you will immediately see a huge white sphere filling the Viewing Screen of your ship. That is Halley's Comet. Your missions always begin at Halley's Comet, and your ship is always moving away from the comet as the mission begins. As you get farther away, the comet will look smaller and smaller. The tail will become visible. Keep moving away from the comet until you are about 500,000 km away. That will give you a good look at it. You'll need to know what it looks like because you will have to return to the secret training installation there many times during your interplanetary travels.



Halley's Comet

2. Now begin braking your ship. You brake by pressing the space bar. Each time you press the space bar, your speed is cut in half. Try to bring the ship to a complete stop (0 km) when it is, say, 600,000 km away from the comet. Then press R to check the Radar Screen. Find your current position. You will see something like this:



Radar Screen

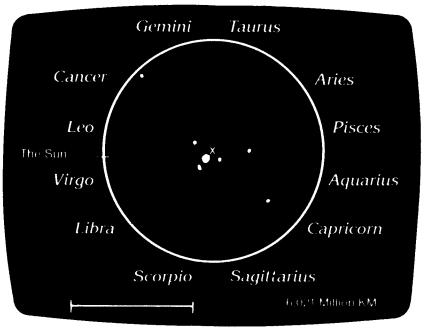
You are always the X in the middle of the circle. Halley's Comet is the flashing dot that, depending on your position, may or may not be visible. Remember that each mission begins at Halley's Comet. So, if you go right to the Radar Screen at the beginning of a mission, Halley's Comet will also be at or near the center of the screen.

Note: Each time you use the program, your exact distance from Earth and your orientation may vary. Remember that all the planets and Halley's Comet are constantly revolving around the sun.

The sun is the largest and brightest dot in the circle. It is truly one of the universe's hot spots, too hot even for star pilots. That's one place you don't want to go. The other dots are the planets. The names of the constellations are located around the outside of the circle. The number at the bottom of the screen indicates the distance, in millions of kilometers, from you to the edge of the circle.

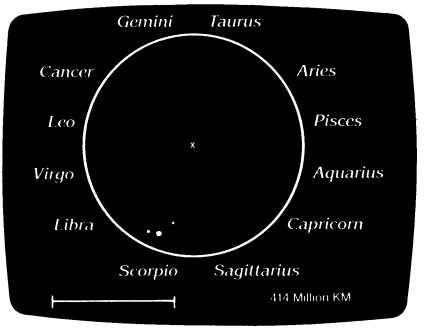
3. Locate your destination planet. In this case, you are looking for Earth. (If your destination is a moon, locate the planet that the moon orbits.) To identify a planet, start from the sun and count out toward the edge of the circle. Earth is the third planet away from the sun. Only Mercury and Venus are closer.

4. If at first you don't see anything helpful on the Radar Screen, zoom OUT by pulling the joystick backward. Now the screen may look like this:



Zoom Out

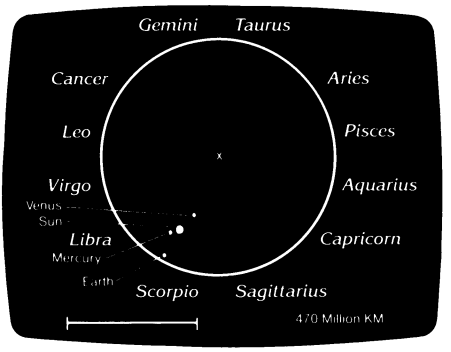
5. If at first the planets appear tightly bunched on the Radar Screen, zoom IN for a closer look by pushing the joystick forward. Now the screen might look like this:



Zoom In

6. Once you find your destination, pull the joystick back until your destination is on the edge of the circle. For this demonstration, pull the joystick back now until Earth is on the edge of the circle. Check the distance scale on the bottom of the screen. That number (in millions of kilometers) is the planet's distance from you.

Your distance from Earth will vary each time you run the program. For example, when you check the Radar Screen, you might find that Earth is 470 million kilometers away from you in the direction of Scorpio. The next time you use the program and try to go to Earth, you might find that Earth is 370 million kilometers away in the direction of Sagittarius.



Earth at Edge of Circle on Radar Screen

7. Notice where your destination is in relation to the constellations shown around the circle. To use the example above, you might find that Earth is 470 million kilometers away in the direction of Scorpio. Once you have lined up Earth with a constellation, look at the Simple Star Map to figure out how to locate that constellation.

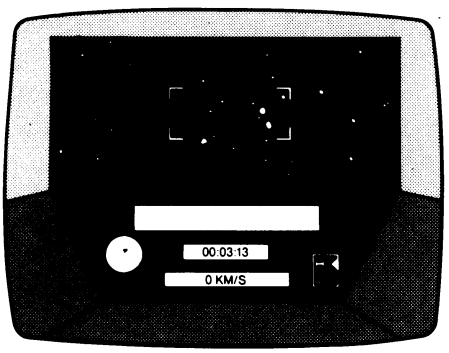
Simple Star Map The Simple Star Map does not include all the stars visible from our Solar System. What it does represent is your field of vision as seen through the Viewing Screen of your spaceship.

On the Simple Star Map you can see 12 constellations. The stars of these constellations are so far away that, no matter how far you travel in our Solar System, they never appear to move. They are fixed points that can guide you to your destinations. Here's how:

You have already used the Radar Screen to determine how far you are from your destination (in this case, Earth).

1. Find the appropriate constellation on the Star Map. Let's say you are looking for Scorpio.

2. Press R on the keyboard to return from the Radar Screen to the Control Panel. Make sure that you are still at a complete stop, then swivel through your field of vision (see Flight Instructions Reference Card) until you find your constellation on the Viewing Screen. If you are using a joystick, make sure you keep the joystick button down while you swivel. Otherwise, your ship will start accelerating again, perhaps in the wrong direction.



Scorpio as Seen Through Viewing Screen

It is often helpful to look for simple, distinct patterns in the stars. If you locate one constellation, you can usually identify those near it.

3. With the constellation fixed in your Viewing Screen, look for your planet. If you are not close enough to the planet, you will not be able to spot it. In this case, Earth is not yet visible because it is too far away.

When you are close enough to have the planet in view, it may look like a star. Compare what you see on the Viewing Screen to your Simple Star Map. A "star" that doesn't appear on the map but that appears in the constellation you are viewing on the screen may well be the planet you seek.

4. Once you spot your goal, you are ready to accelerate toward it and try to land. To find Earth, you will first have to fly toward the constellation until you get close enough to see Earth in your Planet/Moon Finder.

Landing

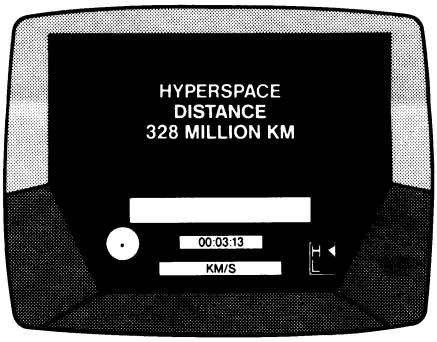
Landing on a planet or moon takes skill and practice. This is where the true star pilots get to show their stuff. Let's continue to assume for now that you are going to land on Earth.

Using Hyperspace—When Your Destination Is Far Away If you have followed along so far, you have your bearings. You have used your Radar Screen to line up Earth with one of the constellations. You know you are x millions of kilometers away from Earth in the direction of one of the constellations. For example, you might be 470 million kilometers away from Earth in the direction of Scorpio. Through your Viewing Screen, the constellation is visible. You are ready for your flight.

1. Make sure you are at a complete stop. That way you will be certain to follow a straight course once you jump to Hyperspace.

2. Set your power to High by pressing H on the keyboard. Move your ship directly ahead—toward the constellation that you've lined up in your Viewing Screen—by pushing the joystick straight forward. Your ship will begin accelerating.

3. Increase your speed. A warning will sound when you reach 250,000 km/s. When you hit 300,000 km/s you will jump to Hyperspace. In Hyperspace you move quickly, traveling many millions of kilometers per second. The distance you travel in Hyperspace is displayed on your Viewing Screen. Remember that the distance indicated on your Radar Screen is the distance between you and your destination, in this case Earth.



Hyperspace

WARNING: When traveling in Hyperspace, you will be moving faster than the speed of light. It is very easy to "overshoot" your destination by many millions of kilometers. Take extra caution when traveling at this speed.

4. When you are within 20 to 30 million kilometers of your destination, press the space bar to brake. For example, if you need to go 470 million kilometers, brake when you reach 440 to 450. When you press the space bar, you will come to a screeching halt.

5. If your destination is in sight, you will see the name of the planet or moon and your distance from it displayed on the Planet/Moon Indicator on your Control Panel. If Earth is in view now, keep it inside the Planet/Moon Finder as you approach. To do this, you may have to adjust your direction a bit. Landing will be a little bit like trying to hit a slowly moving target.

If your destination is not in sight, check the Radar Screen to see how close you have come to your destination. If you still have more than 25 or 30 million km to go, move into Hyperspace again very briefly to get closer. Then go back to the Control Panel and turn your ship around until Earth comes into view.

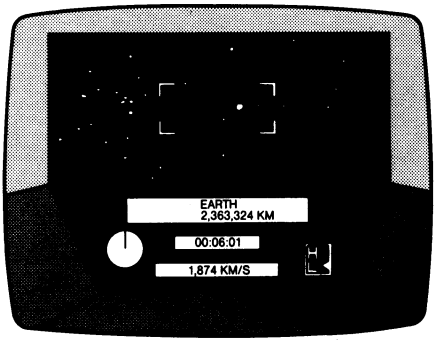
If you cannot find Earth, you may have gone too far. Check the Radar Screen to see if you overshot your mark. You may find that Earth is now in the direction of one of the other constellations. If that is true,

you will have to find that constellation in your Viewing Screen, just as you spotted the first constellation, and then head toward it until "Earth" shows up in your Planet/Moon Indicator.

Orbiting and Landing—When Your Destination is Close Each planet or moon has two landing areas, one on the bright side (facing the sun) and one on the dark side (away from the sun). To protect the secrecy of the test missions, the landing areas are changed from time to time. We can only tell you that you must be within 100,000 km of the planet or moon to be able to land; you may get landing clearance at any point within 100,000 km. This is where your interplanetary experience will be invaluable. The more you do it, the easier it will be.

Follow these general directions each time you want to land on any planet or moon. In this case, you want to land on Earth.

1. When you are within sight of a planet or moon, the Planet/Moon Finder will light up and you will see the name of the body and your distance from it in the Planet/Moon Indicator. If you have gotten this far, Earth should be in view. Center Earth in the Planet/Moon Finder and move toward it. (It might be best to do this at Low power.)



Earth in Sight

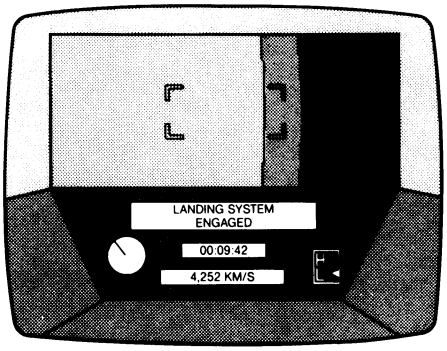
2. Move to within 100,000 km of the planet. You will hear a rhythmic sound to remind you that you are within 100,000 km. Use the brakes to keep your speed under control.

3. You must now locate a landing area on the planet or moon. If you are not already at Low power, shift to Low and begin to orbit the planet. The Planet/Moon Finder will flash and beep when you are above a landing area. The Finder will register the landing area only when you are less than 100,000 km from the planet or moon. Sometimes you may have to get closer before you can land.

As you approach, be patient. Sometimes it takes a lot of orbiting before you find a landing area. Keep moving from side to side. Remember that only part of the planet may be visible. Don't forget to orbit the entire planet; you may get landing clearance from the dark side or the light side. Do not steer directly at a planet, especially when you get close. If you get too close, you will crash, which delays your mission. If this happens, you will see this message: "You crashed on Earth (or another planet), where you will spend one month recovering." If you crash, you will be assessed a time penalty. Five minutes will be added to your time for that mission.

There are two exceptions to this orbiting and landing procedure: Halley's Comet and the sun. Because we are not at liberty to disclose the exact location of the training installation on Halley's Comet, we don't expect you to find a specific landing area there. You need only fly into the comet; P.L.A.N.E.T. will ensure that you return safely to the base. Landing on the sun is not ever advisable; it's simply too hot.

4. When the Finder blinks and beeps to let you know it has located a landing area, press A on the keyboard to activate the Automatic Landing System. You will see a "Landing System Engaged" message on your Control Panel.



Landing System Engaged

5. The ship will automatically land. You will see a message telling you which planet or moon you've landed on and indicating whether or not you successfully completed part of your mission. Your next destination will also be described. Again, the information you get about your next destination may be in the form of a clue . . . You've already been warned that you have to be more than good to qualify for The Halley Project.

6. Press any key to see a picture of the planet or moon you've landed on. In this case, you will see a picture of Earth.

7. Plan your course to your next stop. Then press B on the keyboard to blast off.

Intelligence-Gathering Resources

There are many books about the different fields of astronomy and space exploration. Below are just a few suggestions, both non-fiction and fiction, for the beginning astronomer. To solve some of the clues in the program, you may also want to consult an encyclopedia.

ASTRONOMY BOOKS

Allen, Joseph and Martin, Russell, *Entering Space: An Astronomer's Odyssey.* Stewart, Tabori & Chang, dist. by Workman, 1982. A realistic personal report of an astronaut telling what space flight is really like.

Chapman, Robert and Brandt, John, *The Comet Book: A Guide for the Return of Halley's Comet.* Jones and Bartlett, 1984. Basic introduction to comets, featuring Halley's Comet.

Henbest, Nigel and Couper, Heather, *The Restless Universe.* London: George Philip, 1982. Interesting account of research and speculations about the universe and its parts.

Moche, Dinah L., *Astronomy—A Self-Teaching Guide.* New York: John Wiley & Sons, Inc., 1981. An understandable presentation of the basics.

Rey, H. A., *The Stars.* Boston: Houghton Mifflin Co., 1980. An excellent beginner's guide to the constellations.

Schaaf, Fred, *Wonders of the Sky.* New York: Dover Publications, Inc., 1983. All about naked-eye viewing of comets, eclipses, rainbows, and other phenomena.

Sidgwick, J. B., *Observational Astronomy for Amateurs.* Hillside, N.J.: Enslow Publishing, Inc., 1982. Techniques for advanced amateurs.

Whipple, Fred L., *Orbiting the Sun.* Cambridge, Mass.: Harvard University Press, 1981. In-depth information about the Solar System from a prominent astronomer.

ASTRONOMY PUBLICATIONS

Astronomy. 625 East St. Paul Avenue, P.O. Box 92788, Milwaukee, WI 53202. A magazine particularly suited to the amateur.

Sky and Telescope. Sky Publications, 49 Bay State Road, Cambridge, MA 02238. Excellent range of articles and information for beginners and more advanced astronomers.

SPACE TRAVEL

Michener, James, *Space.* New York: Fawcett, 1983. A fictionalized account of the development of America's space program.

Wolfe, Tom, *The Right Stuff.* New York: Bantam, 1984. Popular tale of America's early astronauts.

SCIENCE FICTION

Much popular science fiction involves visions of people in space, and there are many excellent books. Below are two authors who have excelled at combining science fiction with science fact.

Isaac Asimov is a prolific author of both fiction and non-fiction. He is well-known for both. Among his most popular science fiction works is the Foundation series.

Arthur C. Clarke is also admired for the scientific background he brings to his writing. Clarke is probably best known for authoring *2001: A Space Odyssey.*

Other popular science fiction authors include Ursula LeGuin, Frank Herbert, and Ray Bradbury.

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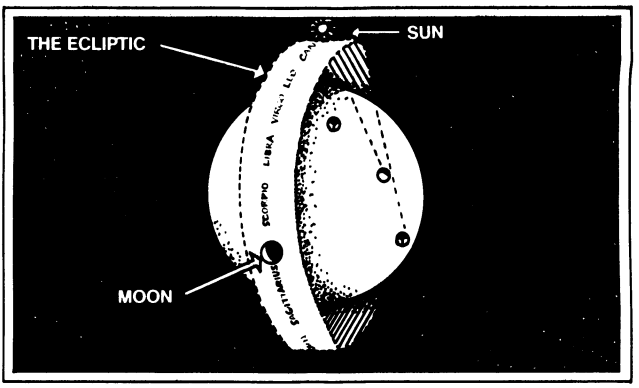
The Halley Project: Debriefing

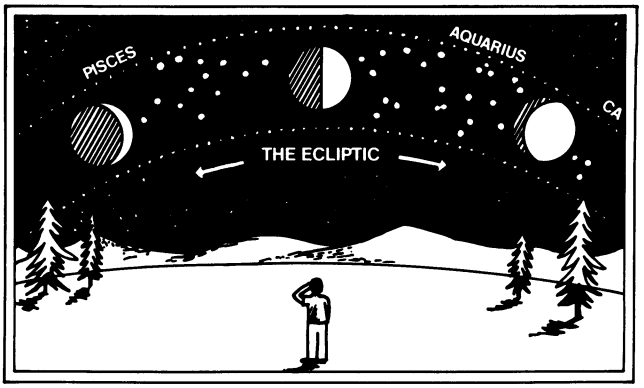
After you complete your training missions, you may face a difficult readjustment period back on Earth. To remain in contact with activities in the Solar System, you may want to do some star-gazing as part of an on-going debriefing process.

All the stars you see in The Halley Project program and on the Simple Star Map included with the package are found along the ecliptic, a band of stars that includes the paths the sun, moon, and planets appear to take during the year. The portion of the ecliptic which can be seen on a given night depends on your location and the time of year.



The Ecliptic

Imagine that the Earth has an enormous ring or band wrapped around it—but very far away from it. This ring is the ecliptic, and it will usually look like a curved strip across the sky.



The Ecliptic: Another View

With some practice and a few helpful hints, you can locate in the sky some of the stars and constellations from The Halley Project. To find stars in the night sky, it is best to start with some familiar reference points. Earth's moon, for example, can be used to pinpoint the ecliptic which, when you are familiar with the program, will contain many recognizable star patterns.

To get an idea of where the ecliptic is located at a given time, pick a two-week period starting one week before a full moon. The weather columns in newspapers usually contain a chart telling you when the moon's phases occur. For each evening of that period, go outside at the same time and look at the moon's location. You might want to keep a sketch showing your view of the sky and draw the moon's position on it. After two weeks, you will see the moon's positions form a curved band through the sky. That band shows the location of the ecliptic for your location and time of year. During the course of the year, the ecliptic moves up and down in the sky; in the summer it is higher, and in winter it is down lower, near the horizon.

Next, look for a simple but familiar pattern in the stars of the ecliptic. The tight cluster of stars in Taurus (called the Pleiades), the twin stars of Gemini, or the three bright stars of Scorpio, for example, are fairly distinctive combinations of stars. Once you find one constellation, you can follow the ecliptic to pinpoint others.

Once you become familiar with some constellations and get your bearings in the night sky, you can become a real stargazer. A variety of "star finder" devices and simple telescopes are available to aid your stargazing.

A Final Note from P.L.A.N.E.T.: Designing The Halley Project

The design of The Halley Project was quite a challenge. Our goal was to create an exciting product based on an accurate model of the Solar System. Certain minor compromises had to be made to enhance the speed and play of the program. The expanse of the Solar System is immense, and we did not want people to get lost among the stars. Microcomputer technology also presented some limitations.

While the constellations of the ecliptic are accurate, not all the stars one might see in space are displayed in the program. The Halley Project includes stars of sixth magnitude or brighter, similar to what is found on many star maps. You will notice, however, that the computer did not allow us to distinguish among the stars' varied brightnesses. Computer limitations also did not permit us to include all the moons of Jupiter and Saturn in the program. Five of Jupiter's known moons and five of Saturn's known moons appear in The Halley Project.

In the real Solar System, the planets look different from the way they appear in The Halley Project. Real planets are different colors, and some have rings. Also, some of the planets' orbits extend outside the plane of the ecliptic. We have flattened those orbits so that all the planets would travel in the same plane. However, the relative size of the bodies, the distances between them, and the speeds of lunar orbits are accurate.

One other area where we had to make adjustments is in your spaceship. The brakes, of course, are not realistic, and neither is the rate at which you are able to accelerate. Finally, Hyperspace does not really exist. It is impossible to travel at the speed of light, and certainly not at many times faster than that. Without Hyperspace, however, it would have literally taken years to complete some of the missions in the program.

We hope you agree that these minor compromises help to make The Halley Project a fun, challenging experience. We also hope you agree that despite these changes, The Halley Project offers an opportunity to understand the basic relationships between the planets, moons, and some of the constellations in our Solar System.

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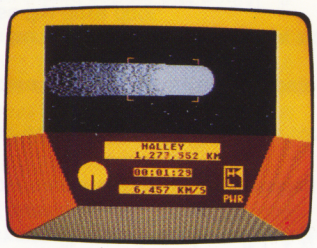
Commodore 64 and Commodore 128 are trademarks of Commodore Electronics Limited.

Entertainment/Education – Teens/Adults

A Mission In Our Solar System



By Tom Snyder Productions

You're an elite star pilot, at the controls of a spacecraft capable of traveling across the entire Solar System. Learn about our Solar System, and use your knowledge to locate and land on planets and moons that move across your computer screen much the same way they move across the sky. *A Mission In Our Solar System* is a remarkable simulation that lets you explore and experience our Solar System.

Features:

- Advanced computer technology that creates a real-time simulation of our Solar System
- A remarkably accurate model for learning facts about our Solar System
- High-resolution graphics that add to the realism

"...a subtly fascinating adventure—and as a technical achievement, it's second to none."
—inCider, *February, 1986.*

"In the tradition of the finest adventure games...a challenging and addicting program..."
—A+ Magazine, *November, 1985.*

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